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Urinary catheterization is used in approximately 15% to 25% of all hospitalized patients (Griffiths & Fernandez, 2007). A physician may decide when it is appropriate for a catheter to be used as part of a patient's therapeutic regimen. There are different catheter options for patients depending on each individual's situation. Urethral urinary catheters are traditionally selected and used in short term cases, and require no surgery (Khan & Abrams, 2008). A suprapubic catheter, (SPC), requires a surgical procedure and has a longer recovery time. According to one Urologist, the ratio of urethral urinary catheters to suprapubic catheters used specifically in his practice was 300:1 (J. Banno, personal communication, February 13, 2011). This is based on physician preference as well as duration the patient will need to have the catheter in place. In the case where long-term catheterization is indicated, SPC have become the superior option (Khan & Abrams, 2008). While the initial insertion of a suprapubic catheter remains the responsibility of a physician, it is within the scope of practice for a nurse to provide care and exchange the tubing with the proper teaching (Illinois Compiled Statutes, 2008). In response to this change, hospital systems have enacted protocols that allow registered nurses (RN's) to perform the suprapubic catheter exchange. Changes should be performed by staff that have been adequately instructed in regards to the technique for changing the catheter, and are able to identify possible complications of SPC changes. Additionally, offering the option of patients and their caregivers to be trained is also important in adding to the patient's independence (Harrison, Lawrence, Morley, Pearce, & Taylor, 2011). The procedure of a suprapubic catheter exchange has been performed by RN's in the community setting with an existing protocol, and more recently the idea that this task be carried out within in the hospital has been explored. This procedure is done by the family members, caregivers, and even the patient themselves in a discharge at home setting safely and efficiently for many years (Anderson, 2002). Therefore adding this protocol into an acute care setting for RN's to complete in the hospital setting is a practical implementation. A nurse led, outpatient services in Musgrove Park Hospital, Taunton has been performing the suprapubic catheter insertions since 2004, and the program had an 89% successful rate over a period of a couple years (Khan & Abrams, 2008). This study shows evidence that nurses are capable of effectively managing a patient's suprapubic catheter Since there is no present protocol for suprapubic catheter exchange or patient care by RN's within the Advocate Christ Hospital system, development of such a protocol has been explicitly requested by stake-holders including physicians and nurse in management within the system. When staff training and education is poor, there is a likelihood of an increase in complications (Harrison et al., 2011). Practice guidelines

better enables nurses in providing patients with their specific care needs. The goal for this project was to create a suprapubic catheter care and exchange protocol based on the best evidence available so that these needs can be met.

Review of Literature

A suprapubic catheter is a urinary drainage system inserted into the bladder via an incision through the anterior abdominal wall, and may be used when a urethral catheter is contraindicated. A suprapubic catheter is a popular choice for patients having to have long-term catheter placement and replaces the need for an indwelling catheter. Suprapubic catheters consist of 4% of hospitalized patients with urethral catheters in situ (Rigby, 2009). Although a small percentage of suprapubic catheters are used compared to other urinary catheter options, there is little literature of published guidelines related to suprapubic catheter management, and at the same time there is a growing need to increase awareness of both the risks and benefits of using a SPC (Harrison et al., 2011). Making this information accessible may increase the successful use of the device in future patient care.

Indications

Suprapubic catheters are used for a wide variety of patients, and for a number of reasons. A catheter insertion may be an elective procedure, or happen in an emergency situation depending on each patient's circumstances. Neurological disease, urinary incontinence, postoperative care, bladder trauma, and palliative care are all reasons a clinician may consider using a suprapubic catheter in a patient's care (Harrison et al., 2011). Many of these conditions require long term catheterization, and each patient and their physician need to discuss if a SPC option is a modality that best fits their specific lifestyle. Presently, SPC's have become more prevalent than indwelling catheters for patients who require long term catheterization (Khan & Abrams, 2008). This may be due to the maintenance of these catheters over a longer period of time.

Contraindications

Under certain circumstances, a SPC should not be used. These include: bladder cancer, if the patient is receiving antiplatelet therapy, presence of abdominal wall sepsis, or if a subcutaneous vascular graft in the abdominal area exists (Harrison et al., 2011).

Advantages

Advantages for the placement of a suprapubic catheter compared to a urethral urinary catheter are evidenced in the cases of a urethral blockage; there is less incidence of leakage in SPC, and a reduced risk of pressure sore damage in wheelchair users. SPC tends to be more comfortable and sexually non-inhibiting. With the use of SPC there is less chance of catheter migration. Studies suggest a lower incidence of bladder cancer in patients managed with an SPC, less than 0.39% over 5 years, compared to indwelling urethral catheters (Khan, Matheur, Timoney, 2007).

Suprapubic catheters have been shown to have a lower infection rates than catheters placed transurethral. A study found that 26% of the transurethral group encountered a urinary tract infection verses only 6% of the patients with the supra pubic catheters (Wells, Steed, Capstick, Schepanksy, Hiltz, & Faught, 2008).

Disadvantages

Although SPC is a good option for many urethral catheter recipients, there are disadvantages nurses and patients need to be aware of when caring for SPC in situ. Some possible disadvantages include: dangerous bowel perforation, urethral leakage and spasm, increased incidence of stone formation, and alteration of body image. One study found that in 185 cases of SPC insertion, 2.7% incidence of bowel perforation occurred with one incidence that had a fatal outcome (Harrison et al., 2011). SPC is also contraindicated in patients with bladder cancer. Technical issues, for example speed of reinsertion, can also result in disadvantages of SPC usage (Rigby, 2009). It is important that if a catheter removed only when a new one can be reinserted immediately to avoid complications. (See complication section)

SPC insertion

The initial insertion procedure requires surgical skill, special equipment, and additional training; it is therefore considered a surgical procedure conducted by a physician. After the initial insertion, the catheter is usually left in place for 4-6 weeks to allow the cystostomy channel time to form (Rigby, 2009; Robinson, 2008; Wimpenny, 2010). This allows time for the catheter track to mature. Subsequent changes following the first change should be done every 6 to 8 weeks and can be done by a trained RN or caregiver (Robinson, 2008; Wimpenny, 2010). For every day that the catheter stays in place approximately 5% of patients will develop bacteriuria and up to 50% may progress over one week, and virtually all patients requiring indwelling urinary catheters for longer than a month become bacteriuria (Dixon, 2010; Rigby, 2009). Having trained personnel available to exchange the catheter in a timely fashion may help decrease these risks.

Protocol Need

Within a hospital system, it is important for protocols of specific procedures to be written step by step so that guidelines can be followed by staff members so consistent care is provided. Policies and procedures provide guidance in patient care for nurses and strive to achieve the goal of safe practice (Long, Burkett, & McGee, 2009). Having uniformity within a hospital system can help deliver expectations for the patient and health care staff. According to the Guidelines for Use of Medical Protocols (2004), each protocol should be individualized for different types of patients, include a time frame required for patient evaluations, well as be readily available to health care staff. Many tasks that a nurse uses while providing care for require up to date, evidence based information made into a protocol for the nurse to follow to ensure the most uniform care. According to Balakas, Potter, Pratt, Rae, & Williams (2009), agencies including the Magnet Recognition Program have incorporated evidence – based practice and research as themes for their organizations to improve the education of the healthcare professionals. Creating a suprapubic catheter exchange protocol is necessary so that nurses can be trained and can execute this task using a step-by-step guideline of care.

Nursing Care

Proper care for a suprapubic catheter is paramount in preventing future complications such as infection, and ensuring the catheter's functionality for as long as possible. It is important to maintain a good standard of cleanliness to reduce the risk of infection (Robinson, 2008). While a patient is hospitalized, it is the responsibility of the health care team to ensure that the insertion site is appropriately maintained. Nursing care for a suprapubic catheter site should be assessed once every shift and actions should be taken depending on the findings.

Infection. Nurses have the responsibility to assess the patient daily so that complications are caught as early as possible. Like all other procedures completed in the hospital, proper hand hygiene is crucial in decreasing the chance of infection (Rigby, 2009; Rushing, 2006; Robinson, 2005; Robinson, 2008). Hand washing should be done before entering a room, when leaving a room, and any time the healthcare provider changes gloves. Rushing (2006) states that if there is a dressing present at the cystostomy site, after removing it and disposing of the gloves, hand hygiene should be performed again before cleaning the site. This further decreases the chances of infection by evidence stating that gloves should be changed after every contact with an infective material that may contain a high concentration of microorganisms (Best Practices, 2003).

Dressing. A dressing change may not be applicable to certain patients depending on the amount of time the patient has had the catheter, and depending on if the doctor has ordered a dressing to the site or not. Suprapubic catheters are used for long-term bladder management, and can be a permanent part of a patient's life (Khan & Abraham, 2008). Once the suprapubic catheter has been in place for at least 6 weeks, the site has healed enough to be uncovered from the dressing (Robinson, 2008). If a patient has had the catheter initially inserted within the last 6 weeks, a dressing may be placed in order to aid the site in healing while keeping infection out. If applicable, all used dressings should be carefully removed and disposed of appropriately when cleaning the site. After the first exchange has taken place, the site will remain exposed for everyday life unless otherwise stated by the doctor's orders. The nurse can also use his or her own judgment and skills to decide if each specific patient needs a dressing over the site depending on the initial assessment.

Assessment. While the cystostomy site is exposed, it should be carefully inspected for signs of infection, skin integrity and any drainage of urine, blood, purulent matter or any other exudates (Rigby, 2009; Robinson, 2008). These cues can be the first signs of complications and need to be addressed immediately. If the nurse suspects infection or has any doubts, a swab can be obtained and sent for culture per doctor's orders (Robinson, 2005).

The nurse must also assess the catheter tube for patency. According to the literature, the tube can come occluded with sediments or clots. This could cause the tube to become dislodged requiring reinsertion by a surgeon. The nurse needs to keep in mind that the catheter should never be irrigated unless ordered by the physician. Irrigation when not ordered could cause complications in the drainage system. It is also essential for the nurse and other staff members to keep the collection container below the patient's bladder level. When turning the patient or when the patient is ambulating, the healthcare staff must ensure that this is followed. The urine itself can also provide indications as to the status of the patient's bladder drainage system. The clarity, color, and odor all need to be assessed as well as measuring the urine at least every 8 hours (Rushing, 2006). The color can detect a possible urinary tract infection, and effective output measurement is important to the patient's therapeutic regimen. (Rushing, 2006)

Before the nurse is done with the assessment it is also important to check the placement of the tubing and make sure that it is secured. This should be done by taping the tubing to the patient's abdomen making sure to leave enough room for the patient to comfortably move. Since the tape is attached to the skin, this must also be included in the daily assessment so that possible skin breakdown can be avoided. (Rushing, 2006)

Exchange

Studies have shown that when a suprapubic catheter is changed by the shift nurse for that patient versus the urologic consult physician, the patient complains of less pain and more comfort during the exchange. Patients are given the opportunity to be premeditated with pain medication when the RN is completing the procedure since the RN is better able to plan for the exchange and give the medication accordingly. (Anderson, 2002)

Sutured. Suprapubic catheters are often sutured in place during the initial insertions to allow healing time for the cystostomy and ensure the catheter maintains correct placement. Once the cystostomy channel has formed and healed the sutures are usually removed. This may not be the case in all suprapubic catheter placements, but if sutures are present, the exchange will remain the responsibility of the physician. A urology consult would likely then be made and a physician would be required to complete the procedure. In cases where the sutures are permanent, this usually designates that the suprapubic catheter has been recently placed, or the catheter is at risk of being pulled out or dislodged based on each individual patient/physician basis and preference. In these circumstances the nurses' responsibilities will be limited to cleaning and maintenance care of the patients' cystostomy site. (See nursing and patient teaching sections for more information regarding care and maintenance.)

Unsutured. A properly positioned SPC with adequate cystostomy does not necessitate sutured abdominal placement. Once healing has occurred sutures are not needed to hold the tubing in place. After the first change has been conducted, a registered nurse then has the option to exchange the suprapubic catheter (Rigby, 2009). The best evidence in regards to how often to exchange a suprapubic catheter is found to be every 6 – 8 weeks (Robinson, 2008; Wimpenny, 2010). The procedure for the exchange of SPC uses an aseptic technique, and the equipment required is similar to that used for urethral catheterization (Robinson, 2008). When changing a suprapubic catheter speed is very important. The new catheter should be inserted within 5-10 minutes of removal of the old catheter. (Rigby, 2009; Wimpenny, 2010). The longer the site is exposed the more chance that bacteria can become a problem. Also, the catheter track will close very rapidly once the catheter has been removed (Harrison et al., 2011). The catheter should never be removed unless an immediate change will take place. When a patient comes to the hospital with a SPC, the health care team should make sure to always have a spare catheter available at the patient's bedside in case of accidental removal (Rigby, 2009).

The exchange of a suprapubic catheter follows a very similar procedure to that of insertion of a urinary catheter. The nurse must check the doctor's orders to ensure the correct size and type of catheter are being used during an exchange (Robinson, 2005). In completing this task the nurse is ensuring that he or she has all of the supplies necessary to begin and complete the procedure within reach. While providing the patients privacy, the nurse should first explain the procedure and obtain the consent of the patient (Chaikind, 2004). Subsequent to this, the patient should be instructed to lie in the supine position, exposing the suprapubic catheter insertion site. Next, the nurse will wash his or her hands with soap and water or antibacterial solution in an effort to decrease the risk of infection during the exchange procedure. Contact isolation precautions should be taken during this procedure since the cystostomy creates a new route to the bladder that may lead to infection. An aseptic approach should be taken throughout the process. A gown and non-sterile gloves should be worn at all times, unless sterile gloves are ordered. (Best Practice, 2003)

Using aseptic technique, open the sterile packages and prepare a clean, convenient working space that is close to the patient. This will further decrease the risk for infection (Best Practice, 2003). If there is a dressing on the client's cystostomy site it should be removed and cleaned with 0.9%

sodium chloride solution to avoid introducing bacteria into the channel during the exchange of the catheter. Remember to clean the site from the inside out and never wipe over a previously cleaned section to decrease the risk of bacteria contaminating the cystostomy channel. The balloon catheter needs to be deflated before the catheter can be removed. Use the empty syringe provided to remove the sterile water from the balloon. With the contaminated gloves still on, remove any tape or straps holding the catheter and catheter bag to the patient. (Rigby, 2009; Robinson, 2005; Wimpenny, 2010)

Next, remove the catheter steadily and slowly to avoid balloon cuffing or possible pain to the patient. Grip catheters at the skin surface area and remove the catheter slowly making sure there is no resistance and the patient is not in any pain. Studies have shown that if there is no resistance or pain in the first 1–2 cm of removal it is unlikely there will be any complications during the removal (Robinson, 2005). Rotating the catheter while removing it aids in reducing the risk of channel damage. Measuring the catheter that was inside the patient will ensure correct placement of the new catheter. After removal of the old catheter, quickly clean the surface area of the patient's cystostomy site of any urine or exudates that may have come out during the removal process. Next, while holding the new catheter at the distance measured from the old catheter, insert the tubing down the cystostomy channel. The new catheter should be inserted as quickly as possible after the removal of the old catheter. The time between removal and insertion of the new catheter should be within 5 to 10 minutes (Rigby, 2009; Wimpenny, 2010). Attach the prefilled syringe containing 10ml of sterile water and inflate the catheter 3–5ml full. It is suggested that this should be done slowly and carefully so that the risk that the catheter tip does not pass into the urethra (Harrison et al., 2011). Pull back slightly until resistance is felt against the bladder wall, then completely inflate the catheter balloon with the remaining sterile water (Rigby, 2009; Robinson, 2005; Robinson, 2008; Xue, 2009).

Attach a new drainage bag to the catheter and secure the new bag in place. Make sure the abdomen and cystostomy site are clean and dry before dressing and taping the new catheter to the patient. Cleaning and drying the area will create a better foundation for the new catheter and lessen the chance of accidental removal as well as decrease irritation and infection risk. Also, taping the catheter tubing to the patient's abdomen will secure it in place and lessen the chance for the catheter to be accidentally removed. Make sure the patient is comfortable and make efforts to reduce any pain throughout the procedure.

Dressing. Generally if a patient's cystostomy site is clean and dry, it is not necessary to put a dressing around the tubing and insertion site. Although some patients may prefer for the area to be covered, topical dressing can be used per patient preference and hospital protocol. Refer to the patient teaching section regarding proper care and maintenance of a suprapubic catheter for more information. (Robinson, 2005)

Complications. As with any medical device, utilization of a suprapubic catheter presents specific and often predictable problems associated with its use. The patient, their family, and associated healthcare providers must assess for complications and take measures to minimize occurrences. If a complication should occur interventions should be implemented to correct these problems as soon as possible. Common complications include: bladder calculi, balloon cuffing, abdominal wall and urethral infections, bleeding, altered body image, latex allergy, over granulation, bypassing whether by urethral and/or entry site, and obesity (Rigby, 2009; Robinson, 2005; Robinson, 2008; Xue, 2009).

Bladder calculi. Occlusion of the catheter causes a variety of problems in addition to compromising the functionality of the device. SPC has a lower incidence of urinary tract infection compared to urethral catheterization although it may increase the incidence of bladder calculi (Wells et al, 2008). One-third of patients with long-term SPC developed bladder stones over a ten-year period (Khan et al., 2007; Sugimura, 2008). Under alkaline conditions minerals precipitate on the outside of the inserted portion of the catheter, especially the tip. This can cause recurrent blockage in around 40% to 50% of long-term catheterized patients. Replacing catheters regularly reduces blockage, and blocked catheters should be replaced promptly" (Rigby, 2009). If a patient is having repeated occurrences of this, exchanging the catheter more often may be helpful in preventing such buildups (Harrison et al., 2011).

Balloon cuffing. Many patients report pain upon the removal of the suprapubic catheter. This is partially due to the detrusor muscle contracting during stimulation. Additionally, it is estimated that the diameter of the catheter increases in size at the location of the cuff even after deflation. Upon removal this size increase is responsible for causing additional pain. In suprapubic catheterization the catheter passes through the detrusor muscle. As the catheter is being removed, the detrusor muscle is stimulated. Stimulation causes the bladder wall to contract, tightening its hold on the catheter. As more force is used to remove the catheter due to restriction and tightening of the bladder wall an accordion type of effect which causes ridges in the deflated catheter balloon and bunching at the catheter tip (Robinson, 2003). Balloon cuffing causes the silicone to stick, which in turn causes pain to the patient and possible lesions down the cystostomy channel. Hydrogel coated latex catheters are now increasingly used in suprapubic sites, unless the patient is allergic to latex (Parkin, Scanlan, Woolley, Grover, Evans, & Feneley, 2002; Robinson, 2003). Having the patient relaxed and encouraging the patient to deep breathe will lessen the constriction on the detrusor muscle resulting in less pain for the patient. Properly premeditating the patient with pain medications prior to the procedure may also help to reduce the anxiety and pain (Anderson, 2002). This problem has been seen more commonly with silicone catheters due to ridges being formed in the balloon that may hinder the catheter withdrawal (Harrison et al., 2011).

Abdominal wall and urethral infections. The patient and/or trained caregiver should inspect the cystostomy site for infection daily and any time the site is exposed. The chance of catheter site infection is always a possibility. Bacteria are inevitably present at some time in a patient's usage of a urinary catheter for a long period of time. This should be treated with antibiotics unless cellulitis is present (Harrison et al., 2011). Additionally, the healthcare provider should assess for signs and symptoms of infection. If the patient is presenting with signs of infection (i.e. foul smelling urine, urine has a cloudy appearance, redness or puss around insertion, etc.) inform the patient's physician and send a sample of the urine or puss to the lab for a culture (Robinson, 2005). "For every day that the catheter stays in place approximately 5% of patients will develop bacteriuria and up to 50% over one week, and virtually all patients requiring indwelling urinary catheters for longer than a month become bacteriuria" (Rigby, 2009). The best practice evidence shows that the catheter should be changed every 6 – 8 weeks and should be cleaned daily (Robinson, 2008; Wimpenny, 2010). This will further prevent infectious microorganisms from leading to future complications. If an infection is apparent whether at the insertion site or within the patient's urine, the patient's physician should be contacted immediately in order to avoid further complications (Best Practice, 2003).

Risk for bleeding. "Hematuria or bleeding of unknown cause can occur at any time. Encrustation and cuffed catheter balloons can cause bleeding along the cystostomy tract. In situations like these, the bleeding should stop fairly quickly" (Robinson, 2005). Patients should be aware of the risk for bleeding and contact their healthcare provider in the event of bleeding that continues.

During the exchange process bleeding may occur. Nurses need to be aware of possible injuries and evaluate each scenario based on the individual patient. Light bleeding is not a cause for worry, but should be monitored for clotting and infection. Bleeding and failure of the catheter to drain properly may indicate that the tip of the catheter is lodged in the urethra. If this has occurred, the catheter balloon should be deflated so that the catheter can be positioned correctly (Harrison et al., 2011). If the bleeding does not stop or the site becomes painful or inflamed consult a physician.

Latex allergy. Latex allergy will present a problem when latex catheters are used. The nurse needs to ask the patient if they have a latex allergy. The nurse must be informed whether the replacement catheter includes latex prior to exchanging it. Silicone catheters are available for patients who have a latex allergy. (Robinson, 2005)

Over granulation. The body's natural healing process may generate over granulation around the cystostomy and "is a common occurrence at the suprapubic entry site" (Robinson, 2003). Over granulation is described as a buildup of scar tissue inside the cystostomy site and around the stoma. This over production of cellular growth will cause a narrowing at the insertion site making exchange very difficult. "Depending on the degree of over granulation no action may need to be taken but this area needs to be observed. However if over granulation is increasing, this problem needs to be treated" (Robinson, 2005). Use nursing judgment to decide if and when the physician needs to be notified because over granulation has begun to cause blockage at the insertion site. Harrison et al. (2011) suggests that the use of silver nitrate can be used to help manage the granulation growth, as long as a barrier cream is used on the surrounding skin so that only the desire area is treated.

Bypassing whether by urethral or entire catheter. Occasionally urine may travel through the urethra or within the channel created by SPC placement. Bypassing through the urethra or cystostomy channel is a common problem in SPC patients. Unless the bladder neck has been surgically closed, it acts as a safety valve. A nurse should also check the catheter for blockage to make sure the urine is not being sent back into the bladder and out the urethra causing the leakage. Additionally, it is recommended to check for incorrect fitting of the drainage system. If the catheter seems like it does not fit snugly inside of the channel, consult the physician to make sure the right sized catheter is being used and nothing is wrong with the channel itself. Antispasmodics and anticholinergic medications can be used in the instance of bladder spasms being the cause for leakage. Use nursing judgment and refer the patient to a urology consult if the leakage continues once all other possibilities have been ruled out. (Robinson, 2005)

Obesity. If the patient is obese a second person may be used to separate the folds of overlapping skin to aid access to the cystostomy site. In some cases the patient may be able to assist the RN, to hold back the extra skin, creating a comfortable, sterile working field for the RN that is doing the exchange. Obese patients also have trouble maintaining a clean, infection free area for SPC placement. Tailored hygiene instruction and reverse demonstration should be done with obese patients to warrant safe effective home care. (Robinson, 2005)

Autonomic dysreflexia. Autonomic dysreflexia is a common complication in spinal cord injury patients and the healthcare provider should be aware of signs and symptoms related to this disorder. Suprapubic catheters are used in many spinal cord injury patients. Therefore, special attention needs to be given to patients with injuries above T6. Complications of autonomic dysreflexia can be life threatening. If there is a kink in the catheter tubing autonomic dysreflexia may occur due to an over reaction of the autonomic nervous system causing excessively and

suddenly high blood pressure. The health care professional would need to immediately recognize this condition, set the patient in an upright position and un-kink the tubing or remove the catheter if symptoms do not subside. (Schottler, 2009)

Documentation

Documentation is an important aspect when giving care. Not only does this show evidence of the patients' progress, but also it is helpful when communication among multiple healthcare staff that may be involved with an individual's care. Insertion site, skin integrity, catheter patency, urine appearance and amount, and patient's pain all need to be documented in each assessment made (Rushing, 2006). The documentation process may be different depending on what type of patient charting is done, but the content will remain the same. Documentation should be completed every shift and include findings from each assessment care rendered and complications should be thoroughly noted. Document the procedure per the hospital protocol making sure to include the type of catheter, length of the catheter inserted, date and time the change took place, size of the catheter used, how much sterile water was used to secure the catheter in place, and how the patient responded to the procedure (Rigby, 2009; Robinson, 2005; Robinson, 2008; Xue, 2009). Documentation of the insertion site should include the color of the skin, presence of any breakdown, tenderness, and exudates that may be present. Patency of the drainage tube needs to be documented. The urine appearance should be documented based on color, odor, and amount. This is done so that an accurate output can be determined. Depending on a patient's specific needs, strict intake and output may affect the p

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